CLAIMS

What is claimed is:

1. A heat dissipation system for a semiconductor device having one or more semiconductor chips, comprising:

a heat dissipation member to cool the one or more semiconductor chips;

an exterior heat dissipation member which is provided opposite to the heat dissipation member, engaged to the semiconductor device and connected to a potential of the heat dissipation system;

an electrical conductor member which is provided between the heat dissipation member and the exterior heat dissipation member, and electrically connects the heat dissipation member and the exterior heat dissipation member to each other; and

a thermal conductivity insulating member which is inserted between the heat dissipation member and the exterior heat dissipation member.

2. The heat dissipation system according to claim 1, wherein the electric conductor member comprises a thin film layer.

3. The heat dissipation system according to claim 2, wherein the thin film layer includes a projection part which is projected from a predetermined position of the thin film layer and contacts at least one of the heat dissipation member and the exterior heat dissipation member.

4. The heat dissipation system according to claim 3, wherein:

the thin film layer further includes an opening part which is provided at a predetermined distance from edges of the thin film layer, and

the thermal conductivity insulating member is accommodated in the opening part.

5. The heat dissipation system according to claim 3, wherein the thin film layer is made of a copper.

6. The heat dissipation system according to claim 3, wherein a thickness of the thin film layer is less than 200μm.

7. The heat dissipation system according to claim 3, wherein the one or more semiconductor chips includes at least one power switching device.

8. The heat dissipation system according to claim 7, wherein the power switching device includes one of a bipolar junction transistor (BJT), a field effect transistor (FET) and an insulated gate bipolar transistor (IGBT).

9. The heat dissipation system according to claim 1, wherein the potential is an electrical ground.

10. The heat dissipation system according to claim 5, wherein the copper thin film layer is tinned.

11. The heat dissipation system according to claim 1, wherein the semiconductor device is a semiconductor power device.

12. The heat dissipation system according to claim 11, wherein the semiconductor power device is one of an intelligent power module (IPM) and an active power device.

13. The heat dissipation system according to claim 1, wherein the heat dissipation member and the exterior heat dissipation member are made of a metal having a high thermal conductivity.

14. A heat dissipation system for a semiconductor device, comprising:

a heat dissipation member provided on the semiconductor device;

an exterior heat dissipation member which is provided opposite to the heat dissipation member, engaged to the semiconductor device and connected to a potential of the heat dissipation system; and

an electrical conductor member which is provided between the heat dissipation member and the exterior heat dissipation member, and electrically connects the heat dissipation member and the exterior heat dissipation member to each other, wherein the electrical conductor member removes a parasitic capacitance between the heat dissipation member and the exterior heat dissipation member.

15. The heat dissipation system according to claim 14, wherein the electrical conductor member removes the parasitic capacitance so as to increase a resistance against common mode noise.

16. The heat dissipation system according to claim 14, further comprising a thermally conductive insulating member which is inserted between the heat dissipation member and the exterior heat dissipation member.

17. The heat dissipation system according to claim 16, wherein the electrical conductor member and the thermally conductive insulating member increase a heat dissipation efficiency of the semiconductor device so as to control noise.

18. The heat dissipation system according to claim 14, wherein the potential is an electrical ground.

19. The heat dissipation system according to claim 14, wherein the semiconductor device includes one or more semiconductor chips having at least one power switching device.

20. The heat dissipation system according to claim 14, wherein the electrical conductor member includes a projection part which contacts at least one of the heat dissipation member and the exterior heat dissipation member.

21. The heat dissipation system according to claim 20, wherein:
the electrical conductor member further includes an opening part, and
a thermal conductivity insulating member is accommodated in the opening part.

22. A heat dissipation system for a semiconductor device, comprising:
a heat dissipation member;
an exterior heat dissipation member which is connected to a potential of the heat dissipation system; and
an electrical conductor member having an electrical conductivity provided between the heat dissipation member and the exterior heat dissipation member.

23. The heat dissipation system according to claim 22, wherein the electrical conductor member removes a parasitic capacitance between the heat dissipation member and the exterior heat dissipation member so as to increase a resistance against noise.

24. The heat dissipation system according to claim 22, further comprising a thermally conductive insulating member which is inserted between the heat dissipation member and the exterior heat dissipation member.